

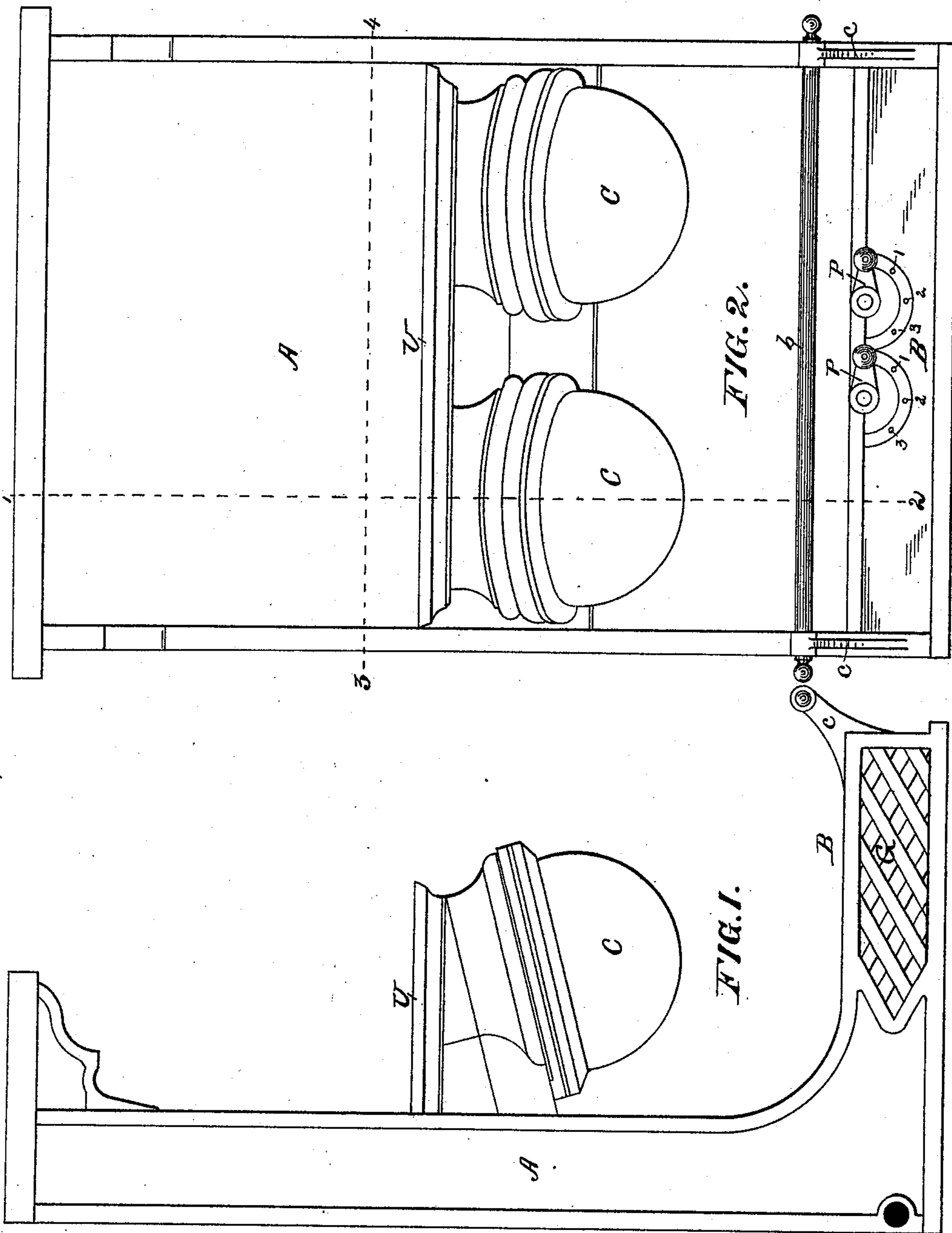
(No Model.)

3 Sheets—Sheet 1.

M. G. WILDER.  
GAS HEATING STOVE.

No. 486,205.

Patented Nov. 15, 1892.



WITNESSES:

Wm R. Webster  
Geo B. Clover

INVENTOR

Moses G. Wilder  
by his attorney  
Chas A. Rutter.

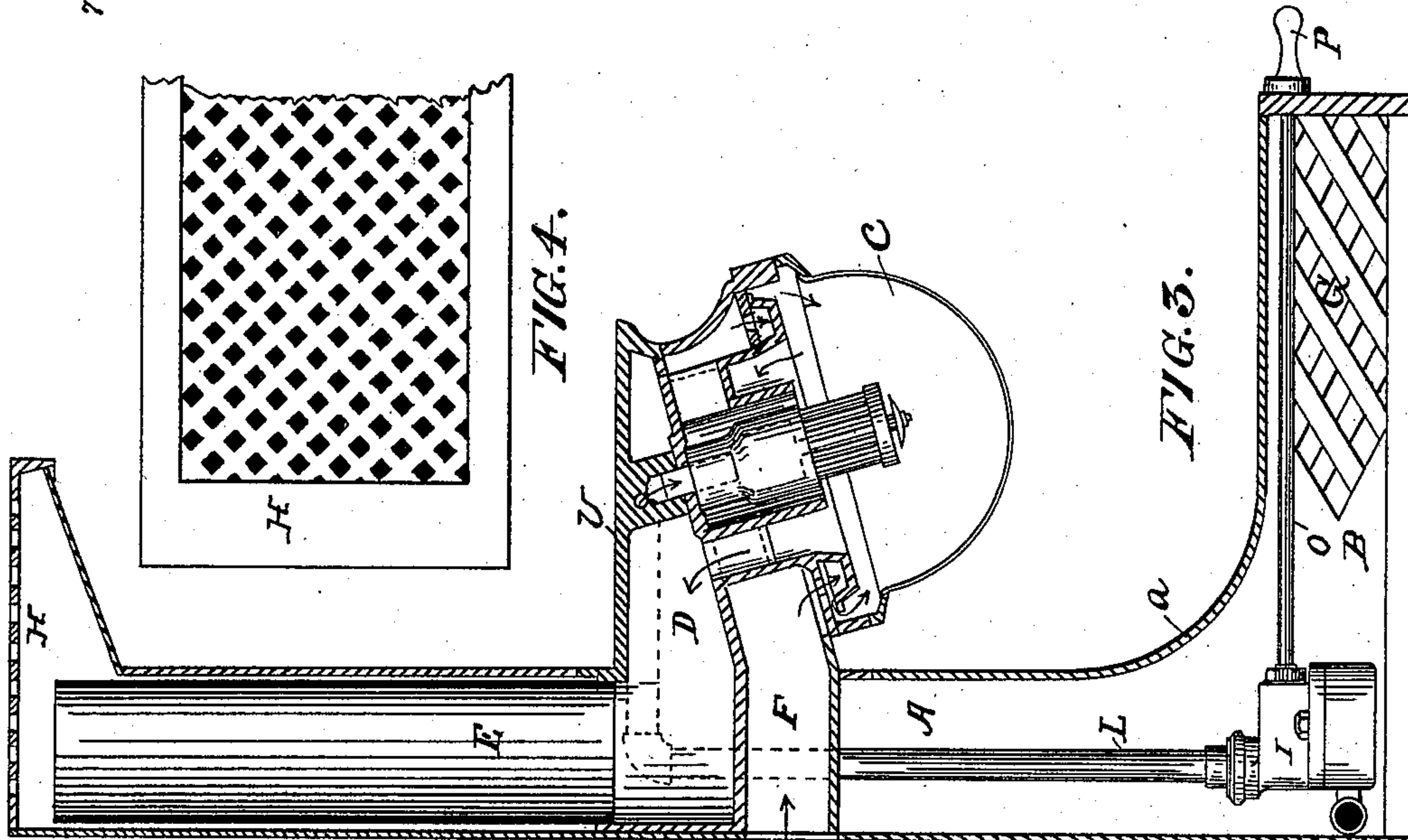
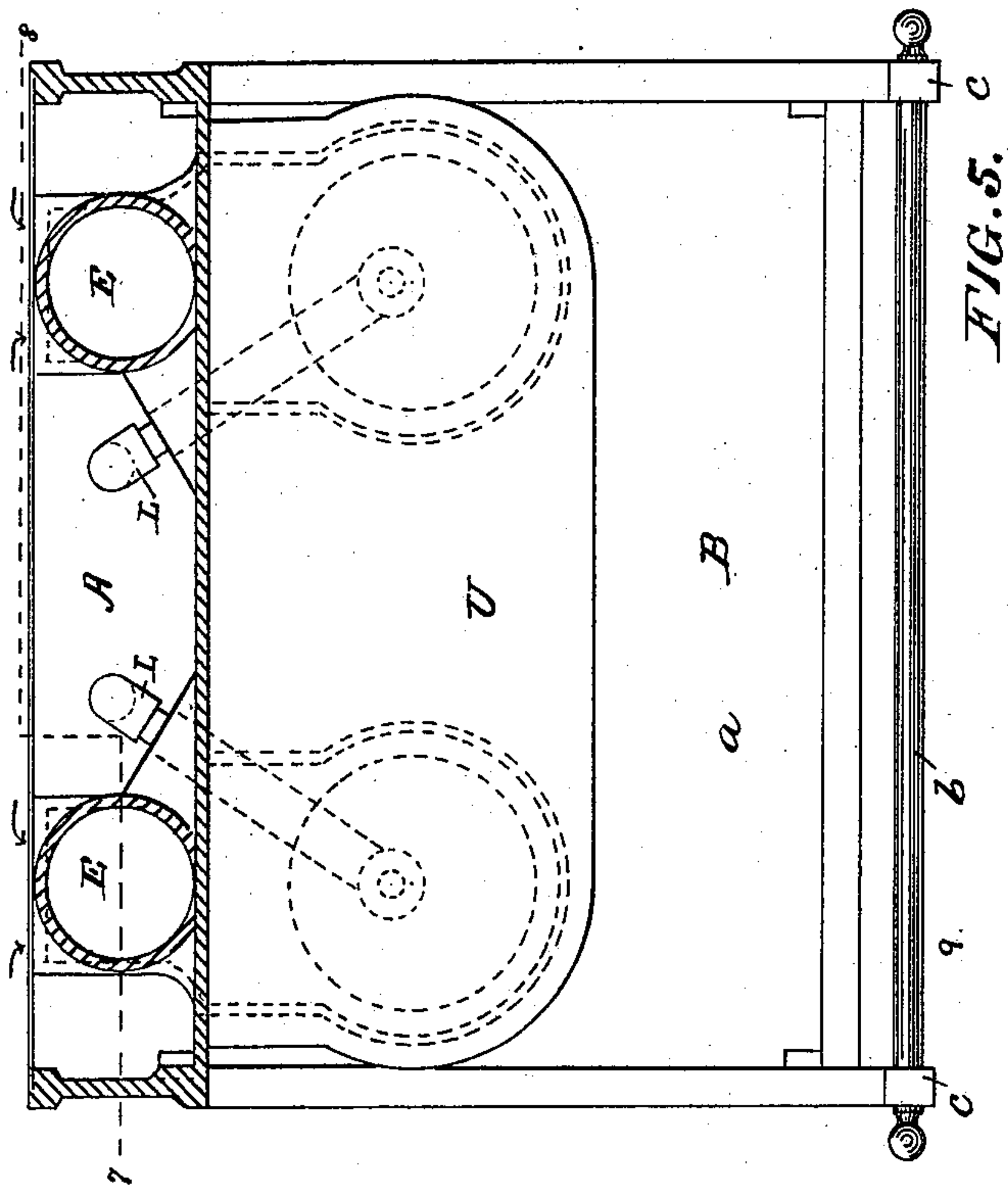
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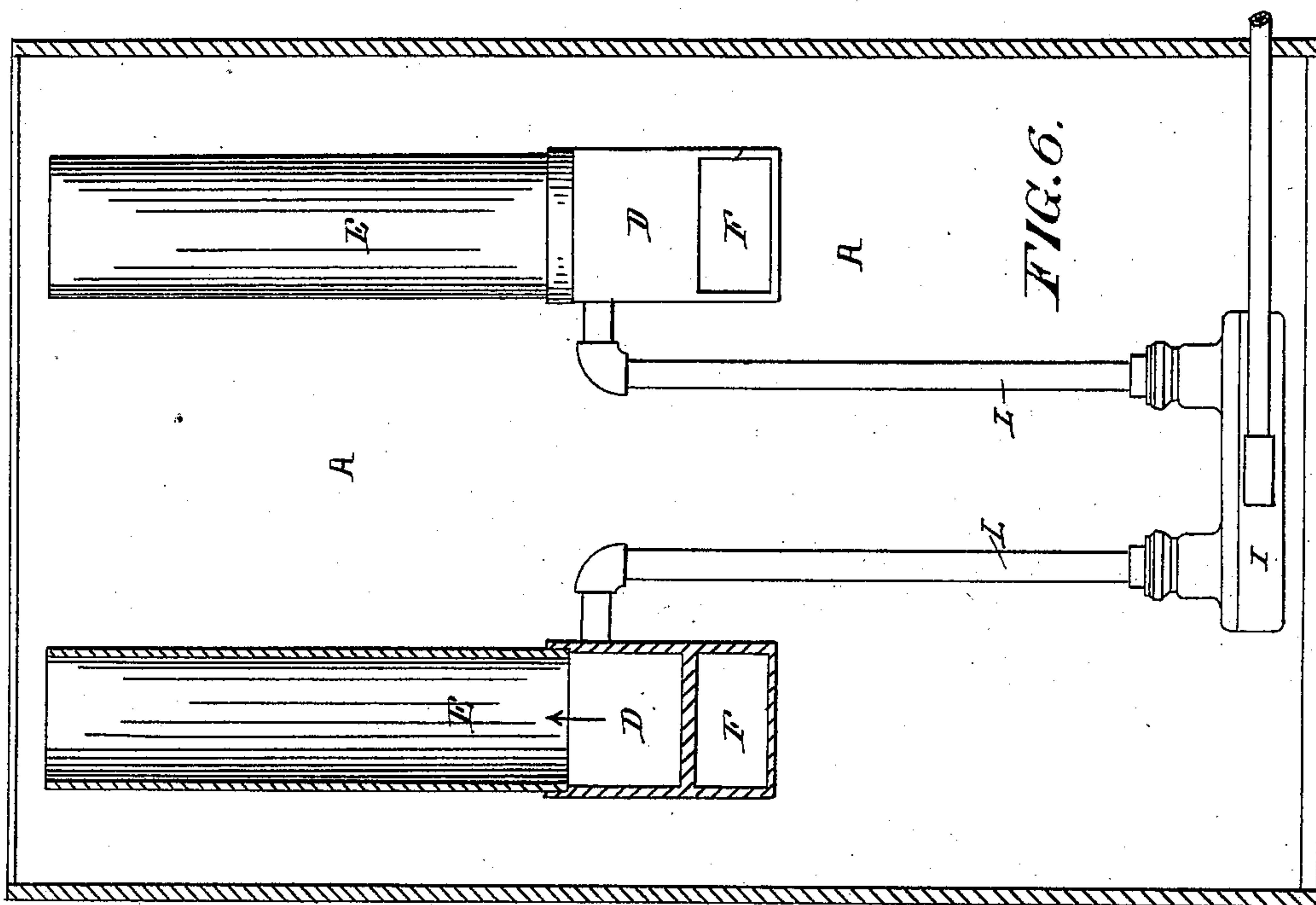
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# UNITED STATES PATENT OFFICE.

MOSES G. WILDER, OF PHILADELPHIA, PENNSYLVANIA.

## GAS HEATING-STOVE.

SPECIFICATION forming part of Letters Patent No. 486,205, dated November 15, 1892.

Application filed August 29, 1891. Serial No. 404,087. (No model.)

*To all whom it may concern:*

Be it known that I, MOSES G. WILDER, a citizen of the United States, and a resident of the city and county of Philadelphia, and State  
5 of Pennsylvania, have invented certain new and useful Improvements in Gas Heating-Stoves, of which the following is a specification.

My invention relates to improvements in  
10 gas heating-stoves; and my invention consists of a regenerating gas burner or burners mounted upon the outside of a vertical air-chamber and over a horizontal air-chamber and hearth, a draft pipe or pipes extending  
15 from the burners laterally into the air-chamber and thence upward to carry off the waste gases from the burners and to cause a circulation of warm air through the air-chamber and to thoroughly mingle the spent gases and  
20 the air to fully heat and equalize the air in an apartment.

My invention is intended to correct several important defects in previous forms of gas-heaters and also to make such heaters safe,  
25 convenient, and economical in use to a degree unknown before.

In the burning of gas the products of perfect combustion are almost entirely composed of carbonic acid, aqueous vapor, and nitrogen. The last two products are not deleterious and need not be considered here. The carbonic-acid gas thrown off from my heater  
30 would be in every case the same in amount as if the gas had been consumed perfectly in good burners used for lighting purposes. If then under all ordinary conditions the gas could be safely burned in an apartment for heating, it is evident that it could be used  
40 for heating also if the conditions were right. Experience has shown that ordinary gas-heaters require connection by a suitable pipe with some chimney or flue to remove the gases thrown off, while my heater may be kept burning for any length of time without any odor  
45 or accumulation of deleterious gases. This throwing off of deleterious gases is due to certain radical defects in the ordinary heaters that have been corrected in my invention.

In using a regenerative burner I hang or  
50 support it at the side of an upright air-flue and directly over a horizontal flue; but it is wholly outside of the main structure of the

heater. I thus gain very important advantages over any arrangement in which the gas-burner is included in or covered by the main  
55 structure. The surfaces immediately about the flames become highly heated and give off radiant heat of much greater effect than would be the case if the heat were absorbed by cooler surfaces about the burner. My heater has,  
60 therefore, the pleasing effect of an open-grate fire, which is rendered more complete and satisfactory by the light produced by the flame, and which owing to the novel position of the burner is diffused through the en-  
65 tire area about the heater. I am enabled to put my burners in this novel position and to still use the heat of the waste gases in causing an active circulation of the air by extending the waste-pipe laterally into  
70 and then upward through the vertical air-flue and causing the gas-current to impinge against the top plate, which mingles the waste gases and the air fully, at or before their discharge from the upright flue. If the waste-  
75 pipe were to open upward without any device for mingling the two currents—viz., the air and waste gases—the gases, being very hot, would tend to rise to the top of the room and, accumulating there, would displace the air,  
80 forcing it downward, while the heat in these gases would be lost in a measure by radiation to the cooler ceiling or walls about them. My combination prevents this by so mingling the  
85 currents that they become mainly one current and do not tend to become separated because of differences of temperature or gravity. In this construction I get perfect combustion and avoid the formation of deleterious gases, as carbon monoxide and acety-  
90 lene, and therefore have no need of a chimney connection to carry them away. Having no chimney connection, I do not waste a large share of the heat produced, which is all effective in warming the apartment. My heater  
95 is, therefore, economical to a degree unknown before.

In the accompanying drawings, forming part of this specification, and in which similar letters of reference indicate similar parts  
100 throughout the several views, Figure 1 is a side and Fig. 2 a front elevation of a gas heating-stove embodying my improvements; Fig. 3, a section of Fig. 2 on line 1 2; Fig. 4, a plan



of part of top or baffle-plate of stove; Fig. 5, a section of Fig. 2 on line 3 4; Fig. 6, a sectional elevation of Fig. 5 on line 7 8.

A, Figs. 1, 2, 3, 5, and 6, is an upright air-chamber extended laterally, as at B, to form a hearth. This air-chamber is formed with front and back and end walls, which may be made of either cast or sheet metal.

C is a regenerative gas-burner of any pattern, that shown in the drawings being what is known in the trade as a "Lungren" regenerative burner, and while I prefer to use a burner of this pattern I do not desire to confine myself to its use, as any gas-burner may be used. I suspend this burner against the side of the upright air-flue A and over the horizontal air-flue B, which is connected to the flue A, as shown. An opening D conducts the waste gases from the burner to a draft-pipe E, which is placed within the upright air-chamber A.

F is an opening or passage extending from the rear side of the air-chamber A, through which fresh air is admitted to the burner to support the combustion of the gases. This arrangement of the air-duct F avoids the variation in the air-supply to the burner which would take place were the air supplied from the air chamber or flue A, and which variation would be due to the upward motion of the air under variations of temperature.

The air-duct passes through the upright air-chamber merely for convenience, and it will be understood that the air-supply for the burner may be taken from a point beneath the stove or from any place not liable to be affected by drafts or currents of air, it being essential to the proper operation of the burner that the air supplied to it be unaffected by drafts.

Stoves of this kind are usually placed with their backs close to a wall. Hence I have shown the air-supply to the burner taken from the back of the stove, as this is the place least likely to be affected by the drafts or currents of air in the room.

The top *a* of the horizontal air-chamber B is a thin metal plate, which forms a hearth which reaches out to a foot-rest *b*, conveniently placed for warming the feet by the heat radiated from the burners C. The foot-rest is supported by the sides of the air-chamber, which are formed into suitable projecting arms *c* for this purpose. The horizontal air-chamber B extends from the foot-rest, which is well forward of the burners, back to a connection with the upright air-chamber A, which is located back of the burners.

G are openings in the sides of horizontal air-chamber B, through which air is admitted under the hearth.

The upright flue or air-chamber occupies the entire space between the sides of the heater-body, as shown in Figs. 1, 2, 3, 5, and 6. At the bottom it communicates freely with the horizontal air-chamber B, as shown in Fig. 3, and its top is covered with a perforated

plate H, a part plan of which is shown in Fig. 4, and which acts as a baffle-plate to thoroughly mix and mingle the hot air and gases before they leave the flue A. Air entering under the hearth through openings G is warmed by contact with the heated plate *a*, which is heated by radiation from the burners C, passes backward and enters the upright flue A and, rising, comes in contact with the intensely-heated waste-pipes E, through which the waste products of combustion pass from the burner, and is then discharged through the perforated top plate H into the apartment. The openings G being near the floor, the cool air is drawn in and warmed as it passes upward. At first coming in contact with moderately-heated surfaces and afterwards with surfaces that are more highly heated, it is thoroughly warmed before it is discharged through the perforated top plate. The intensely-heated gases passing from the burners are discharged from the waste-pipe E directly into the ascending current of air in the air-flue A under the top plate. These gases and the air are thus thoroughly mingled as they pass through the perforations in the plate H. An active circulation of the air in the entire apartment into and through the heater is thus secured, and the spent gases thrown off from the burners are so thoroughly mixed with the air of the apartment that no injurious accumulations of gases can take place, as would occur if the spent gases could stagnate and displace the air in any part of the room.

Gas is supplied to the burners through pipes L, Figs. 3, 5, and 6, which are connected with a supply-pipe in any suitable manner.

Figs. 3 and 6 is a case which contains a valve by means of which the supply of gas to the burners is regulated. This valve may be of any suitable kind.

O is a rod, and P a lever connected to this rod and by means of which the valve I may be operated to regulate the supply of gas to the burners.

U is a shelf which forms part of the casting or shell of the upper part of the burners and which becomes greatly heated by contact of the spent gases while the burners are in operation and which is convenient for warming water, &c.

While I have described the burners as regenerative throughout my specification, and while I prefer to use burners of this class, it will be understood that covered burners not regenerative may be used where the highest efficiency of the burners is not required.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, in a gas-heater, of an upright air-chamber or circulating-flue, a perforated top or cover for said flue, an inclosed gas-burner supported at the side of said upright flue and at a point above its bottom, and a draft-pipe extending from said burner into said upright air-chamber and thence up-



ward to a point below the perforated top of said chamber, and through which the hot waste gases from the burners pass and act upon the air in said chamber or flue to produce an upward circulation.

2. The combination of an upright air-chamber extended laterally at its base to form a hearth, a perforated top or cover for said air-chamber, an inclosed gas burner or burners placed at the side of the said upright air-chamber and over said hearth, a draft pipe or pipes extending laterally from said burners into said air-chamber and thence upward to a point below said perforated top, an air-duct for supplying air to said burners, and suitable openings near the bottom of said air-chamber to permit entrance of air to be acted upon by the heated hearth and the heat from the waste gases passing through said draft-pipe to cause a circulation under said hearth and upward through said upright air-chamber.

3. The combination, with the upright air chamber or flue, of the inclosed gas-burners supported at the side thereof and at a point above the bottom of said flue, a draft-pipe extending from said burners into said flue and thence upward to a point below the top of said flue, and a duct for supplying air to said burners, all substantially as and for the purposes set forth.

4. The combination, with the upright air chamber or flue, of the inclosed burners supported at the side thereof and at a point above the bottom of said flue and a draft-pipe extending from said burners into said flue and thence upward to a point below the top of said flue, substantially as and for the purposes set forth.

MOSES G. WILDER.

Witnesses:

JOHN I. GREEN,  
CHAS. A. RUTTER.